

I claim:

1. A multi-channel surround sound expansion method comprising the steps of:
reading a stereo sound signal including a left sound signal and a right sound
signal;
5 expanding said stereo sound signal into a Front L channel, a Front R channel,
a Front M channel, a Rear L channel and a Rear R channel sound signals;
performing a sound reverberation operation on sound signals of said Front L
channel and said Front R channel or said Rear L channel and said Rear R
channel to generate sound with echo/reverberation;
10 delaying said Rear L channel and Rear R channel sound signals for a first
time value; and
advancing said Front M channel sound signal for a second time value.
2. The multi-channel surround sound expansion method as claimed in claim 1,
wherein said step of expanding said stereo sound signal into multi-channel
15 sound signals is accomplished by using a Hafler technique to output said left
sound signal directly to said Front L channel, output said right sound signal
to said Front R channel, output said left sound signal minus said right sound
signal to said Rear L channel, and output said right sound signal minus said
left sound signal to said Rear R channel.
- 20 3. The multi-channel surround sound expansion method as claimed in claim 2,
wherein said Front L channel and Front R channel sound signals are sound
signals having low-frequency components filtered out through a high-pass
filtering operation.
4. The multi-channel surround sound expansion method as claimed in claim 3,

wherein the frequency response of said high-pass filtering operation is about -10dB at 6KHz.

5. The multi-channel surround sound expansion method as claimed in claim 2,
wherein said Front M channel sound signal is a sound signal having
5 high-frequency components filtered out through a low-pass filtering
operation.

6. The multi-channel surround sound expansion method as claimed in claim 5,
wherein the frequency response of said low-pass filtering operation is
about -30dB at 6KHz.

10 7. The multi-channel surround sound expansion method as claimed in claim 2,
wherein said Rear L channel and Rear R channel sound signals are sound
signals having high-frequency components filtered out through a low-pass
filtering operation.

8. The multi-channel surround sound expansion method as claimed in claim 7,
15 wherein the frequency response of said low-pass filtering operation is
about -30dB at 10KHz.

9. The multi-channel surround sound expansion method as claimed in claim 1,
wherein said step of expanding said stereo sound signal into multi-channel
sound signals is accomplished by a Hafler technique to directly output said
20 left sound signal minus said right sound signal to said Front L channel,
output said right sound signal minus said left sound signal to said Front R
channel, output said left sound signal to said Rear L channel, and output said
right sound signal to said Rear R channel.

10. The multi-channel surround sound expansion method as claimed in claim 9,

wherein said Front L channel and Front R channel sound signals are sound signals having high-frequency components filtered out through a low-pass filtering operation.

11. The multi-channel surround sound expansion method as claimed in claim 5 10, wherein the frequency response of said low-pass filtering operation is about -30dB at 10KHz.
12. The multi-channel surround sound expansion method as claimed in claim 9, wherein said Front M channel sound signal is a sound signal whose high-frequency components are filtered out through a low-pass filtering operation. 10
13. The multi-channel surround sound expansion method as claimed in claim 12, wherein the frequency response of said low-pass filtering operation is about -30dB at 6KHz.
14. The multi-channel surround sound expansion method as claimed in claim 9, 15 wherein said Rear L channel and Rear R channel sound signals are sound signals having low-frequency components filtered out through a high-pass filtering operation.
15. The multi-channel surround sound expansion method as claimed in claim 14, wherein the frequency response of said high-pass filtering operation is 20 about -10dB at 6KHz.
16. The multi-channel surround sound expansion method as claimed in claim 1, wherein said multi-channel sound signals further include a super bass channel sound signal.
17. The multi-channel surround sound expansion method as claimed in claim

- 16, wherein said super base channel sound signal is obtained by using at least a low-pass filtering operation to filter out high-frequency components of said left sound signal and said right sound channel.
18. The multi-channel surround sound expansion method as claimed in claim 1,
5 wherein said Front M channel sound signal is a mean of said left sound signal and said right sound signal.
19. The multi-channel surround sound expansion method as claimed in claim 1, wherein said multi-channel sound signals further include a Rear M channel sound signal.
- 10 20. The multi-channel surround sound expansion method as claimed in claim 19, wherein said Rear M channel sound signal is a mean of said Rear L channel and Rear R channel sound signals.
21. The multi-channel surround sound expansion method as claimed in claim 1, wherein said multi-channel sound signals further include at least a Middle L
15 channel sound signal and at least a Middle R channel sound signal.
22. The multi-channel surround sound expansion method as claimed in claim 21, wherein said Middle L channel sound signal is a copy of said Rear L channel sound signal, and said Middle R channel sound signal is a copy of said Rear R channel sound signal.
- 20 23. The multi-channel surround sound expansion method as claimed in claim 1, wherein said first time value is between about 10 and 20ms.
24. The multi-channel surround sound expansion method as claimed in claim 1, wherein said second time value is between about 2 and 4ms.
25. The multi-channel surround sound expansion method as claimed in claim 1,

wherein said sound reverberation operation is accomplished through a feedback delay networks technique.

26. The multi-channel surround sound expansion method as claimed in claim 25, wherein a plurality of delay queues and a queue matrix are provided in said feedback delay networks technique, a channel sound signal is input into said delay queues to generate a plurality of delay signals fed back to said delay queues via said queue matrix, and said channel sound signal is finally added to said channel to form a continually fed-back sound with reverberation.
27. The multi-channel surround sound expansion method as claimed in claim 26, wherein said delay signals generated by said delay queues are obtained by setting a delay constant to said delay queues.
28. The multi-channel surround sound expansion method as claimed in claim 26, wherein delay times generated by said delay queues are different from one another.